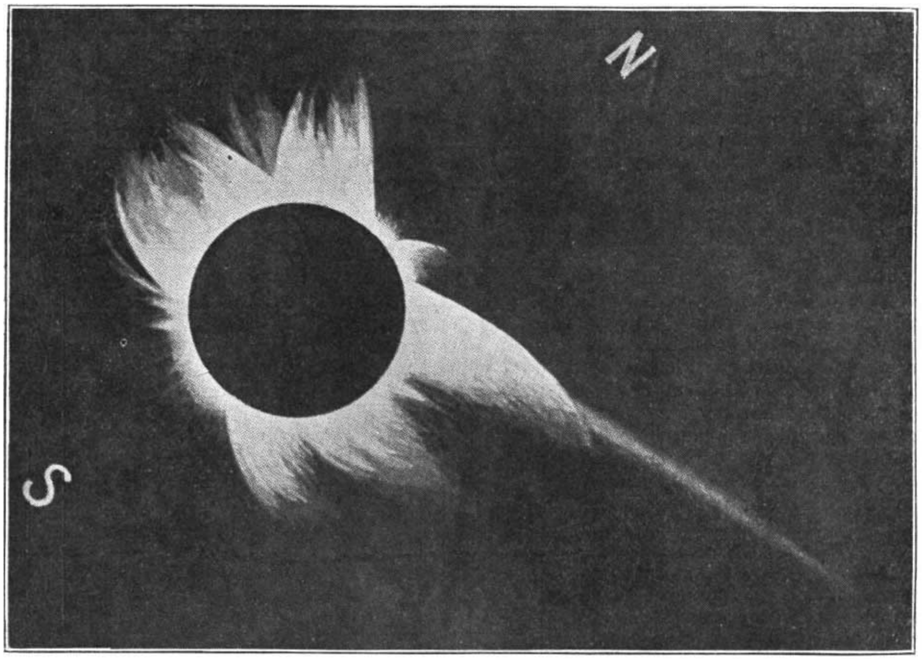
RUSSIAN OBSERVATIONS OF THE CORONA OF AUGUST 9, 1896.

I HAVE for many years been a reader of your honourable and interesting journal of science, NATURE. I beg you to accept for it the accompanying picture of the solar corona, as I had the opportunity to see it on August 9, 1896, in Sii-Kavuopio (on the Upper Muanio, in Lappania), where I went last summer as a member of the Lappanian Solar Eclipse Expedition of the Russian Astronomical Society.



This photograph is the reproduction of a drawing carefully made by myself on the same scale for the Astronomical Society, and in which I tried to combine all the details of ten corona-photographs, which our expedition were successful in obtaining, the instruments used being—

A 7-inch refractor (object-glass "Merz").
A 4-inch camera (object-glass "Ross").
A 2-inch camera (object-glass "Steinheil").

Combined with the pictures obtained by these is the general impression of the corona, as seen with the eyes, during fine and calm weather and very transparent air.

NICOLAS KAULBARS,
Lieutenant-General, and Chief of Staff of
the Finland Military District.

NOTES.

AT the last meeting of the Chemical Society it was announced that Mr. J. J. Tustin had made a donation of one thousand guineas to the Research Fund of the Society.

M. FILHOL has been elected a member of the Section of Anatomy and Zoology of the Paris Academy of Sciences, in succession to the late M. Sappey.

THE Paris Academy of Sciences has been invited to send representatives to the International Congress of Naval Engineers and Architects, to be held in London next July. Efforts are being made to ensure that the forthcoming meeting in London shall be as brilliant and generous in hospitality as the last one held in Paris.

THE German Emperor is always ready to recognise deserving work in science. He has just conferred the Order of the Crown on Dr. Hauchecorne, the Director of the Prussian Geological Survey and of the Berlin School of Mines, and the Order of the Red Eagle on Dr. Hampe, the eminent Professor of Chemistry at the Clausthal School of Mines, and on Dr. Loretz, of the Prussian Geological Survey.

PROF. CHARLES D. WALCOTT, Director of the United States Geological Survey, reports to the Secretary of the Interior the existence of an enormous gold belt in Alaska. An expedition sent out by the Survey in May last, investigated the valley of the Yukon River, from the British boundary to the mouth of the river. All the well-known placer deposits were examined, and the origin of the gold in them was found to be the quartz veins along the head-waters of the various streams entering the Yukon. The length of the gold belt in Alaska is 300 miles, entering that territory near the mouth of Forty-Mile Creek, and extending westward along the Yukon valley at the Ramparts.

M. FAYE, whose contributions to astronomy and meteorology are of world-wide renown, was elected a Member of the Paris Academy of Sciences in January, 1847. In honour of his jubilee, at the meeting of the Academy on Monday, M. Chatin, the new President, delivered an eloquent tribute to a life devoted to the advancement of science, and enumerated his most notable achievements. At the close he presented M. Faye with a gold medal representing the astronomer's effigy surrounded by an inscription affirming the pride of his colleagues in his friendship, and their admiration for his work. We learn from the *Times* that at a dinner at the Grand Hotel on Monday evening, presided over by M. Jannsen, M. Faye received from General Billot, Minister of War, the insignia of the Grand Cross of the Legion of Honour, bestowed upon him by special decree of the President of the Republic. M. Rambaud, Minister of Education, was also present, and among those who spoke were M. Loewy, Director of the Paris Observatory, and General Toulza, of the École

Polytechnique. M. Faye's numerous friends and pupils at this school offered him a group in bronze. M. Faye was the favourite pupil of Arago, and is now eighty-three years of age.

In connection with the International Committee of Aeronautics, the second ascent of sounding balloons will take place on Monday next, February 1, at 11 a.m., local time, at each station participating in the work. The balloons are fitted with instruments for registering temperature and altitude, and have an ascending force more than five times greater than that due to the total weight. Any one who should happen to witness the descent of one of the balloons should carefully look after the records, and send them to the office of the *Aerophile*, 14 rue des grands Carrières, Paris.

It will be of interest to botanists and zoologists throughout the world, to learn that a biological survey of Alabama has been organised and put into operation. The survey will be carried on under the auspices of the Alabama Polytechnic Institute, and will be manned by the specialists engaged at that institution in the various lines of biological investigation. It will have for its object the study, in field and laboratory, of all plants and animals occurring in the State, and of the various conditions affecting them. The work will be done systematically and thoroughly, and all the results published. In a region so interesting and little worked as this portion of the Southern United States, careful and extended research will be sure to yield results of the greatest value. Large quantities of material in all groups of plants, and of animals (especially insects) will be collected and properly prepared. In connection with the survey there has been founded an Exchange Bureau, from which will be distributed all duplicate material. Any one desiring to correspond relative to specimens, literature, or the work of the survey, should address, "Alabama Biological Survey, Auburn, Alabama."

At the General Horticultural Exhibition to be held in Hamburg from May to September in the present year, there will be a scientific department, managed by a committee, of which Dr. Zacharias and Dr. Klebahn are members. Exhibitions are invited and prizes offered in the following special subjects: (1) Diseases of cultivated plants produced by mechanical causes, or by conditions of atmosphere or soil; (2) animal and vegetable enemies of horticulture and fruit-growing; (3) animal and vegetable friends of horticulture; (4) abnormalities and sports; (5) comparative experiments on manures; (6) wild ancestral forms of cultivated plants; (7) living exotic useful plants in pots; (8) collections of the most important exotic useful plants (dried specimens), or of preparations from them; (9) collections of plants, or parts of plants, from morphological or biological points of view; (10) results of scientific experiments on pollination; (11) scientific aid to horticulture—implements, tables, models, &c. Information of intended exhibits should be sent to the Director of the Botanic Garden, Hamburg, before March 1.

M. M. Cornu has been elected President of the Botanical Society of France for the current year.

The Annual Meeting of the German Botanical Association will be held this year in Frankfurt-a-Main, commencing on September 22.

A Botanical Museum has been established at Weimar, at the sole cost of Prof. Haussknecht. It is designed to be "a Central Institution for investigations in systematic botany," and will be under the control of the Thuringian Botanical Union.

A violent earthquake is reported to have occurred in the district of Delvino, in Epirus. Several villages are stated to have been destroyed, and it is feared that there has been serious loss of life.

The death is announced of Mr. T. Gwyn Elger, well known by his numerous contributions to selenography, both in the form of drawings and notes of the principal features of the lunar surface. Mr. Elger became a Fellow of the Royal Astronomical Society in 1871, and was in his sixtieth year at the time of his death.

We notice with regret the announcement of the death of Dr. Edward Ballard, author of many papers and works on medical and scientific subjects. Dr. Ballard was elected a Fellow of the Royal Society in 1889. He was eminently distinguished as an investigator of causes of disease, and as a promoter of scientific sanitary administration. Among numerous other works, he published a valuable paper "On the influence of weather and season on public health, based on the statistical study of 272,000 cases of sickness (1857-68)." He was also the author of many important reports to the Local Government Board on particular outbreaks of disease, local, or more or less general.

Towards the end of last year, George Daniel Eduard Weyer, the Professor of Mathematics and Astronomy at the Kiel University, passed away. Prof. Weyer was a great favourite among the students, and was as well known among the officers of the Merchant Service of Germany as he was among those of the Royal Navy. On account of his astronomical calling, he was familiarly known as "alte Seni," and every one loved him—from Admiral to Lieutenant—for nearly all of them had been his pupils at some time or other, and this was how they expressed their familiarity for their old teacher. A brief summary of the positions Prof. Weyer held during his lifetime will serve, perhaps, to show how he eventually became so closely connected with the Navy. Born at Hamburg in the year 1818, he spent four years (1839-43) at the Hamburg Observatory. For the next two years he studied astronomy and mathematics in Berlin. From 1847-50 he was assistant at the Hamburg Observatory, and teacher at the School of Navigation in connection with the observatory. When the School for Naval Cadets was established in Kiel, Weyer accepted a position there. In 1852 he was a "Privatdocent" at the University, and was made "Ordentliche" Professor in 1860. His connection with the Navy may be said to have now begun. In 1864 he was the Examiner in Navigation for the Prussian Navy, and lectured for more than twenty years at the Marine-Akademie in Kiel. Weyer was the author of many works, most of which related to nautical astronomy, and his aim throughout was directed to the improvement of the methods of determination of position at sea. His death will be felt by all his friends and pupils, for he was widely known, and last, but not least, by nautical science, which loses a faithful student.

> "Mein Sohn, nichts in der Welt ist unbedeutend,
> Das erste aber und Hauptsächlichste
> Beim allem ird'schen Ding ist Ort und Stunde."
> (Seni in *Wallenstein's Tod*, I. Part.)

For the last month (says the *Times*) the Colonial Office, the Natal and Cape Governments, and the Board of Agriculture have been in communication as to the best means of preventing the cattle plague in South Africa from spreading into either Natal or the Cape Colony. Various inquiries have been made as to what steps should be taken, and on Thursday last, at the Board of Agriculture, a special conference of heads of departments concerned was held to consult together on the subject. The chief officials concerned of the Board of Agriculture and the Colonial Office met the Agents-General of Natal and the Cape Colony and other Cape authorities. Further meetings will be held on the subject, and it is contemplated that the Government will sanction every effort to save the colonies of Natal and the Cape from rinderpest.

Since the plague was officially recognised in the Bombay mortality returns on September 26, and despite the decrease in the population, 9835 deaths have occurred in excess of the average for the last five years. These are attributed by the *Times of India* to the plague. Continental Governments are showing great activity in regard to precautionary measures. The Austrian Academy of Science has decided to despatch three medical men to Bombay to study the circumstances connected with the prevailing epidemic. A special sanitary mission, sent by the Medical Board and accompanied by the French delegate, has left Suez for the quarantine stations on the coast of the Sinai Peninsula, in order to determine what measures are necessary to assure the immunity of Egypt from contagion. The *Times* correspondent at St. Petersburg states that the Russian newspapers continue to complain of the British Government for delaying to take measures against the spread of the plague. To secure the safety of Russia's Asiatic possessions, the Minister of the Interior has issued instructions for the opening of fourteen stations of medical observation along the land frontiers of Persia, Afghanistan, and Chinese Kashgar. A special commission has been appointed by the Tsar to take measures for the prevention of the importation of the plague into Russia. Practically all the European Governments have appointed representatives for the Sanitary Conference to be held at Venice on February 10.

THE weather has continued very wintry during the past week, sharp frost occurring at night over the entire kingdom, and snow has fallen on most days over a large part of the country. A heavy north-easterly gale occurred on Friday and Saturday, the storm, coupled with the high sea which was running, doing much damage on our east coasts. The gale was accompanied by a heavy fall of snow, deep drifts being formed in the midland, southern, and eastern districts of England, and occasioning much inconvenience and delay to the ordinary traffic. In places trains were blocked, and some few deaths have occurred owing to the severity of the weather. There was a temporary give in the frost on Monday, owing to the arrival over the northern part of our islands of a cyclonic storm area from the Atlantic. There was a renewal of the gales on our coasts, and snow fell again in many places. In London a heavy snow squall occurred at about five o'clock on Monday afternoon, and was accompanied by thunder and lightning. The frost was very sharp again on Tuesday and Wednesday, but the changes of temperature continue very fitful.

THE worked flints obtained by Mr. W. J. Lewis Abbott from the Cromer Forest-Bed are described by him in the February number of *Natural Science*. For the benefit of those not familiar with the geology of the Cromer district, it is pointed out that the valley to the west of Cromer, towards Sherringham, is still cloaked with a palæolithic gravel, below which come the fantastically-twisted and folded glacial beds, termed the contorted drift, and under this occurs the Forest Bed series. This series is, however, not a Forest-Bed at all, but was deposited in the estuary of a river. The flints obtained by Mr. Abbott have every appearance of having been fashioned by man. The conclusion arrived at is: "Bearing past history in mind, and the reception which has been accorded to these specimens, the unquestionable evidences they offer of being artificially worked, the unmistakable positions from which they were obtained, and the conditions under which some of them were found in the matrix, are we not justified in admitting the existence of man in Britain in the Forest Bed period?"

MR. J. LL. WILLIAMS has a very curious note in the number of the *Journal of Botany* for January, on the drunken habits of certain humble-bees. The intoxicant is the honey produced by the crowded flowers of the capitulate heads of certain Compositæ (*Carduus nutans* and *lanceolatus*, and *Centaurea Scabiosa*), and Dipsacaceæ (*Scabiosa succisa*). The intoxication is indicated by rolling on the back, striking the legs wildly in the air, and general helplessness. The bees rapidly recovered from the effects, and, in most cases, were eager to repeat the debauch; but one individual, which had been shut up in a vasculum with copious supplies of *Centaurea Scabiosa*, manifested, the next morning, a praiseworthy remorse and disgust, "raising its head and fore-legs as high as it could above the plants, then precipitately hurrying away as soon as released." The most dissolute species appears to be the neuter of *Bombus lapidarius*. The author suggests that this may in time become a normal mode of cross-pollinating the flowers in queston.

SOME interesting experiments by Prof. Felix Plateau, of Ghent (*Bulletin de l'Académie Royale de Belgique*), tend to disprove the view, so often advanced, that the brightly coloured petals of flowers are necessary to attract insects. The method of observation adopted—viz. by removing the corolla and watching whether insects continue to visit the flower—had previously led to contradictory results in the hands of different observers, including Charles Darwin. These discrepancies the author attributes to want of care in removing the petals; care must, indeed, be taken to avoid handling the flowers, or doing anything which might influence an insect's sense of smell. Prof. Plateau removed the brightly coloured corollas from the flowers of *Lobelia Erinus*, *Œnothera biennis*, *Ipomœa purpurea*, *Delphinium Ajacis*, *Digitalis purpurea*, and *Antirrhinum majus*, and the blue barren florets from the capitulum of *Centaurea cyanus*. In every case, except that of *Antirrhinum majus*, the mutilated flowers were observed to be freely visited by various kinds of insects (bees, bumble-bees, flies of the *Syrphidæ* family, and an occasional butterfly), no special preference being exhibited for flowers that were left intact. The insects not only sucked honey from the mutilated flowers, but they often circled round them without alighting. In the case of the snapdragon, several bumble-bees hovered round the mutilated heads, but subsequently left them for those with entire flowers, a result explained by the peculiar mode in which bees have to enter the corolla, which would render the absence of that organ perplexing to them. Finally, Prof. Plateau covered several of the large umbels of *Heracleum Fischerii* with rhubarb leaves, and it was found that even when thus masked they were freely visited by insects. These results suggest that insects are guided to flowers largely by their sense of smell.

IN the same publication, M. Victor Willem describes experiments showing that the variations observed by Semper and Varigny, in the development of fresh-water mollusca (*Limnæa*, *Planorbis*), are attributable to the greater or lesser aëration of the water in which they grow, those specimens which are reared with free access of air developing to the largest size.

PROF. D. MAZZOTTO has completed a determination of the index of refraction of water for electric waves of length varying from two metres down to twenty-five centimetres. The experiments, which are described in the *Atti dei Lincei*, show that between these limits the index is constant and equal to 9·00 at 19°, thus agreeing well with the theoretical value (8·85) obtained by taking the square root of the dielectric constant.

IN a part of the *Proceedings* of the Biological Society of Washington, just issued, Dr. C. H. Merriam describes a very remarkable small, short-eared, tailless rabbit, which has recently been discovered on Mount Popocatepetl, in Mexico, at the height of about 10,000 feet. This singular animal, which, instead of moving by leaps, like an ordinary rabbit, runs about on all-fours, in the grass of the mountain, has been named by Dr. Merriam *Romerolagus Nelsoni*. The clavicles in this new form are complete, and not imperfect as is usual in the family *Leporidæ*.

THE mammals collected by Dr. Donaldson Smith, during his recent expedition to Lake Rudolf, have just been described at Philadelphia by Mr. S. N. Rhoads. The collection contained representatives of fifty genera and seventy-seven species, seven of which are now characterised as new. These are mostly rodents. Perhaps the most noticeable discovery is that of a second species of the very peculiar African genus *Lophiomys*, which Mr. Rhoads proposes to call *Lophiomys Smithi*. Dr. Donaldson Smith also obtained a specimen of the curious hairless mole-rat, *Heterocephalus glaber*, of which only two examples had been previously captured.

MR. FREDERIC W. TRUE, the Curator of the Department of Mammals in the U.S. National Museum, has just completed and published an excellent review of the Moles of North America, based principally on the large series of specimens of these insectivorus mammals under his charge. He recognises two sub-families of Moles as occurring in the Nearctic Region, *Talpinæ*, with four genera, and *Mygalinæ*, with one genus. Special attention is paid to the distribution of these animals in America, which presents several interesting features. Two of the five genera of Moles are strictly confined to the Pacific Coast, while the three remaining genera are only met with east of the Rocky Mountains. The most remarkable form, perhaps, of the American Moles is the so-called Star-nosed Mole (*Condylura cristata*), which carries an enlarged fleshy disc at the extremity of its snout, obviously for use as a highly developed tactile organ.

THE insects which affect the cotton plant in the United States are described by Mr. L. O. Howard in *Bulletin* No. 33, published by the U. S. Department of Agriculture. The cultivation of cotton in the United States has gone through a curious change with regard to the depredations of insects. Not very long ago, the average annual loss to the cotton-growers from the work of a single species of insect amounted to 15,000,000 dols. This insect was the so-called cotton caterpillar, or cotton-leaf worm (the larva of *Aletia argillacea*, Hübn.). Down to the year 1881 the damage done by this insect so far exceeded that inflicted by any other species that other forms had received but little consideration. Since about 1880, however, the cotton-worm has ceased to be a serious enemy to cotton. It is undoubtedly much less abundant and destructive than it was fifteen years ago, and no longer holds the first position among the insect enemies of the cotton crop. The so-called bollworm (the larva of *Heliothis armiger*, Hübn.), which a few years ago did much lesss damage than the cotton-leaf worm, now ranks as the most prominent enemy. It is curious to note this decline of one harmful insect and rise of another. Students of biology will remember many similar instances.

THE uncertainty which still exists as to the ultimate causes of volcanic outbursts is illustrated by two papers which appear, at no great distance apart, in the *Proceedings* of the Boston Society of Natural History for 1896. The author of each paper starts out with the consideration of certain phenomena occurring on a small scale, and eventually applies his conclusions to the problem of the distribution of volcanoes; but both start and conclusion are widely separate in the two cases. Mr. N. S. Shaler begins with the escape of gases from a viscous liquid, and noting how, once a path is opened up, a regular procession of bubbles follows along it, applies this first to explain the vertical jets of water and gas that issued from the ground at the Charleston earthquake, and then to the repetition of volcanic eruptions at the same locality. He suggests that it is the water included in deposited sediments which becomes the explosive steam of a volcanic outburst, and regards rapidity of sedimentation and the conductivity of the earth's crust as correlated factors in the establishment of volcanic action in any region of the earth's surface. Mr. J. B. Woodworth, on the other hand, deals with the details of fracture under strain, and his paper is illustrated with some very beautiful photo-reproductions of the fracture-surfaces of fine-grained homogeneous rocks. He compares the distribution of volcanos (particularly in the Sandwich Islands and western coast of the Pacific) with the distribution of fracture-lines at the margin of a joint surface. Whether this comparison be justified by further study or not, the paper is a most valuable addition to the literature of fracture-structures.

AN interesting note on the Australian Snow Country has been received from Mr. John Plummer, of Sydney. A railway journey of only thirteen hours separates Sydney from the threshold of a region of ice and snow, where, even during the hottest days of the Australian summer, fires and blankets are necessary, while residents on the interior plains are suffering from the sweltering heat. Mount Kosciusko, the highest peak in Australia, being 7171 feet above sea-level, is in that cool region. It forms part of the Muniong Range, the northernmost portion of the Australian Alps, which extend across the upper waters of the Murray into Victoria, the whole of the surrounding country being more or less mountainous. The hills of the Muniong Range are popularly known as the Snowy Mountains, portions of their summits being above the line of perpetual snow. There is no Alpine climbing to be done in scaling Mount Kosciusko. The ascent begins in reality twenty-five miles away from the summit, and the slope is so gradual that it may be performed without fatigue by any one in ordinary health. Highest Australian mountain though it is, the visitor can drive to the top of it. There are no trees within some miles of the mountain top; but gigantic mosses grow there, and beautiful wild flowers. Loveliest of all, perhaps, are the mountain snowdrop and the elychrisan, or everlasting flower, which in this district has a black centre instead of the more common yellow one. Another interesting feature of the locality is the number of small lakes formed by the melting of the snow in basins between the hills. The highest of these lakes—it is the highest sheet of water in Australia—is situated about 300 feet from the summit of Mount Kosciusko.

ALTHOUGH milk has so frequently been held responsible for the dissemination of diphtheria, yet curiously but few exact investigations have been made on the behaviour of diphtheria bacilli in milk. Hesse found that cholera bacilli underwent deterioration in raw milk; that, in fact, when kept in these surroundings at a temperature of 37° C., they were entirely destroyed within 22 hours. Caro of Naples, on the other hand, working with anthrax bacilli in raw milk, states that these microbes flourish abundantly in milk, and abate no jot of their virulence under these conditions. Prof. Schottelius has repeated these experiments, and has entirely confirmed them; he has, however, extended his investigations to the behaviour of diphtheria bacilli in milk. In a recent number of the *Centralblatt für Bakteriologie*, Part i., a summarised account is given of these researches, and it appears that in fresh milk diphtheria bacilli find an exceptionally satisfactory material for growth and multiplication. In sterilised milk, however, their growth was not so abundant, and was less strongly marked than in the ordinary broth used for cultivation purposes. As the milk was only sterilised for half an hour by means of the ordinary Soxhlet apparatus, this difference in the vitality of the diphtheria bacilli in the raw and heated milk, respectively, could not have been due to the milk having become acid through heating. Hesse has shown that when milk is subjected to prolonged sterilisation at a high temperature it exhibits an acid reaction. Prof. Schottelius concludes his paper with a warning, now so often repeated, of the danger attending the consumption of milk in its raw unsterilised condition.

THE origin and evolution of human marriage is a subject that appeals to many minds, and much has been written upon it by more or less competent students. In *The American Anthropologist* for November 1896, W. J. McGee deals with some marriage observances of a few American aboriginal tribes. He traces an instructive sequence, beginning with the Seri Indians, who are probably the most primitive people in North America, and about whom very little has previously been published. Amongst these peoples the man is a suitor, not so much from personal inclination as from tribal incentive; individual caprice is subordinated to the welfare of the community, and the matter is regulated by his female relatives and the maiden's mother and maternal uncles. Theoretically they are monogamous; marriage takes place only between members of different clans, but invariably within the tribe, infringement of the latter law being their greatest vice. The organisation of the Zuñi remains essentially maternal, the chief modification being the relaxation of the fierce tribal endogamy. The would-be bride is the chief suitor, as among the Tarahumari Indians of northern Mexico, where, according to Lumholtz, the maiden is a persistent wooer. Essentially the same stage is represented by the Seneca Indians, a more warlike tribe than the two last. The characteristic features of these and other American tribes organised on the basis of mother-descent, are monogamy, clan exogamy, tribal endogamy, the absence of bride purchase, and rudimentary personal inclination. Among the Indians of British Columbia, as described by Boas, mother-descent is merged with or passed into paternal organisation. A temporary exchange of property on the part of the groom, who is the suitor, occurs among the Kwakiutl, and the laws of monogamy, clan exogamy and tribal endogamy are materially relaxed. This tendency is increased among the Omaha and neighbouring Siouan Indians; individual inclination becomes dominant, and wife-purchase obtains, with a concomitant degradation of woman; finally, the monogamic principle is almost wholly lost. In all the higher forms there are various vestiges of antecedent customs, so that every stage can be traced in observance and decadence.

IT is pointed out in the *Bulletin of Miscellaneous Information* of the Royal Botanic Gardens, Trinidad, that the rainfall for that island is slowly but surely decreasing. The average rainfall for the decade 1862–71 was 66·715 inches; for the next decade (1872-81) it was 65·993, and for the third decade (1882-91) it was 65·037. The decrease indicated by the first and third values is 1·678 inches, or 251 per cent. during the thirty years from 1862 to 1891. Presuming that the same rate of decrease runs on for the next sixty years, Trinidad will then suffer from a rainfall diminished by about 8 inches. Mr. Hart points out that a rainfall decreasing at such a rate is alarming; and, if the inference is carried on, it follows that within a measurable distance of time Trinidad must become an arid desert as barren as the Great Sahara. The cause of the decrease is said to be the disappearance of the forests.

WE have received from Mr. A. L. Rotch an interesting pamphlet, reprinted from *Appalachia*, vol. viii., and entitled "The Exploration of the Air," containing a brief account of all the leading experiments, either in balloons, on mountains, or by means of kites, made for the purpose of solving such problems as decrease of temperature and humidity with elevation, the heights to which areas of high and low barometric pressure extend, and the circulation of the atmosphere at various heights; also containing good photographic views of some of the prominent observatories, and a diagram of comparative altitudes attained. The highest meteorological station in the world is that at El Misti, in Peru (19,200 feet), which was established by the Harvard College Observatory. It is impossible for observers to remain at this station, so it is provided with automatic instruments, which require only occasional attention. Among the other most notable mountain stations are Rocher des Bosses on the Alps (14,320 feet), and Sonnblick (10,170 feet). The only way in which the temperature and humidity of the highest regions can be obtained is by means of unmanned balloons, which have reached altitudes of over ten miles. Recent experiments by these balloons have given temperatures of 90° below zero of the Fahrenheit scale. Recent improvements in kites have allowed observations to be recorded at a height of nearly 4000 feet, and have revealed many interesting facts. It seems not improbable that this simple method of "sounding" the atmosphere will in the future be used, in connection with observations made at the earth's surface, in forming synoptic charts for forecasting weather.

THE *Oesterreichische Botanische Zeitschrift* for November 1896, gives some interesting particulars of Herr Sintenis's botanical expedition in Greece.

The second annual general report upon the mineral industry of the United Kingdom, for the year 1895, by Prof. C. Le Neve Foster, F.R.S., is published as a Blue Book. The report is a unique collection of statistics upon the minerals raised in Great Britain and Ireland, and the persons employed in mines.

AT the annual general meeting of the Geologists' Association, to be held on Friday, February 5, at University College, the President, Mr. E. T. Newton, F.R.S., will deliver an address on "The Evidence for the presence of Man in the Tertiary Period."

A NUMBER of good reproductions of photographs of lightning, and of effects produced by the discharge, accompany an article, by Mr. Jeremy Broome, in the February number of the *Strand Magazine*. In the *English Illustrated Magazine*, Mr. W. A. Horn gives a good general account of the results of the scientific expedition to Central Australia, the cost of which was generously defrayed by him. Some of the illustrations from the report on the geology and botany of the region traversed (see NATURE, p. 185) accompany the article.

THE third part of Mr. Sydney Rowland's "Archives of Clinical Skiagraphy" (the Rebman Publishing Company) has just appeared. It will be remembered that the publication consists of a series of collotype illustrations with descriptive text, representing applications of Röntgen photography to medicine and surgery. The new part contains Röntgen photographs of fracture of the olecranon treated by suturing with wire, fracture of lower end of humerus, with separation of the external condyle, a case of hip-joint disease, supernumerary toes, a double human monstrosity, united fracture of both bones of the forearm before and after union by wiring, and the cardiac area.

MR. W. L. DISTANT makes his bow in the January number of the *Zoologist*, and delivers his prologue as editor of the series commenced under his guidance. He inaugurates the new era in the life of our contemporary by announcing that the official reports of Natural History Societies will be discontinued. Prehistoric man, his past history, physical peculiarities, and connection with the old British fauna, is to be given his place in the pages; and, to show that our remote ancestors really ought not to be disregarded by zoologists, Mr. E. W. Brabrook contributes to the present number an article on "Man in Zoology." No longer is man to be considered as outside the domain of zoology. "Evolution," remarks Mr. Distant, "is now the established corner-stone of the zoological edifice," and upon it the new series is apparently to be built. Facts are, however, as necessary as philosophy; therefore full space will be given to recording them, the only conditions being that they are original. These are admirable designs, and if future numbers of the new series carry them out as well as the opening one, a full measure of success will be the reward.

THE Smithsonian Report for 1894 has just been received. As is now well known, and it cannot be too widely known, the Report of the Smithsonian Institution not only exhibits the financial affairs, operations, and conditions of the Institution, but also comprises a selection of miscellaneous memoirs of interest to every one engaged in the promotion of knowledge. This appendix in the present Report runs into more than 600 pages, and is made up of reprints of thirty-seven papers, written by leaders in many branches of science. All these papers deal with important scientific work or problems, and they possess the additional advantage of being written in language easy of comprehension. Seventy plates illustrate the papers, and there are numerous figures in the text. The publication of such collections of papers as have been included in the Smithsonian Reports since 1889, embracing a considerable range of scientific investigation and discussion, is of enormous value to all who are interested in the progress of natural knowledge.

IN Part iv. of the quarterly *Journal* of the Sanitary Institute (vol. xvii.), just published, are several papers of interest. Small-pox and the beneficent effects of vaccination are the subjects of two papers. Dr. Arthur Newsholme describes a number of positive instances of the spread of enteric fever by means of sewage-contaminated shell-fish; Dr. Sims Woodhead urges the inspection of dairy farms, and the bacteriological examination of the milk therefrom, as well as of the agencies which distribute it; Mr. W. Hunting discusses tuberculosis in relation to public health; and Dr. H. Scurfield lays down an anti-tuberculosis programme. Among other subjects dealt with are the bacterial filtration of public water-supplies, by Mr. Wolf Defries; dangerous constituents of colliery air, by Prof. Frank Clowes; sanitation in Denmark, by Dr. J. Carlsen; the treatment of sewage (several papers); the planning of secondary schools, by J. Osborne Smith; the bacterial examination of water and sand filtration, by Prof. Percy Frankland, F.R.S.; the effect of cold weather upon health, by Dr. A. Lockhart Gillespie. All these papers were read at the Congress held at Newcastle-upon-Tyne last year.

AN important relation between the optically active forms of methylmannoside, $C_7H_{14}O_6$, and the inactive racemic form of the same substance, has been brought to light by Prof. Emil Fischer and L. Beensch. The active forms can be separately recrystallised from warm water without undergoing any change. When they are both dissolved in water so as to produce an inactive solution, crystals of the racemic form are deposited, provided that the temperature of the liquid is above 15°. If the temperature, on the other hand, be below 8°, the two active forms separate out in individual crystals, which can be mechanically separated, and some of which are found to consist of the pure dextro-compound, others of the pure lævo-compound. Both the active and the inactive forms crystallise without water, and this is the first instance in which this phenomenon has been observed in the absence of water of crystallisation. In all previously known cases the racemic form has crystallised with less water than the active forms, a fact which might be expected to favour its formation at a higher temperature.

THE name of glycogen may still convey to some the idea of the substance that forms grape sugar; but it is used in a wider sense in a recent work by Dr. Charles Creighton. The work is "Microscopical Researches on the Formative Property of Glycogen," and the first part of it, dealing with the physiological side of the subject, has just been published by Messrs. A. and C. Black. Not with the sugar-yielding character of glycogen, but with its tissue-making property, is Dr. Creighton concerned; and the present publication describes the researches of others and himself on this problem of glycogen in formative processes. The observations on the presence of this substance in hibernating animals furnish a few new facts. From the evidence so far obtained, Dr. Creighton states:—"We find that in hibernation glycogen is present, and may be abundant, in the liver, which is against the rule of starving animals; that it is present in some peculiar way in the muscular and pulmonary tissues, and that it is found in granules in fat-cells. Any attempted interpretation of these facts cannot but be hazardous while so many other relevant facts remain to be determined exactly; but it seems probable, as Voit has conjectured, for the hepatic glycogen, that the store of fat is utilised by being converted into glycogen. As to the hibernating gland, its function appears in some way correlated to the wasting of the fat-store during the winter, the gland-substance becoming physiologically most active in correspondence with the wasting of the animal's fat in general. We await the completion of Dr. Creighton's work before reviewing it.

THE additions to the Zoological Society's Gardens during the past week include two Four-horned Antelopes (*Petraceros quadricornis*, ♂ ♀) from India, presented by Colonel W. W. Lean; two Buzzards (*Buteo vulgaris*) from South Wales, presented by Mr. H. Edgar Thomas; two Carrion Crows (*Corvus corone*), British, presented by Mr. Alfred Greaves; a Golden Eagle (*Aquila chrysaetus*) from Greece, presented by Dr. H. O. Forbes; a Goosander (*Mergus merganser*) from Holland, purchased.

OUR ASTRONOMICAL COLUMN.

OXYGEN IN THE SUN.—Herren Runge and Paschen have recently suggested (*Astrophysical Journal*, No. 5) a criterium by which the presence of oxygen in the sun may be directly ascertained. They have found that in a vacuum tube filled with oxygen, the line at 7775, discovered by Piazzi Smyth, has two components, the strongest being the most refrangible and the weakest the least refrangible; the wave-lengths of the three are 7772·26, 7774·30, and 7775·97. In the solar spectrum about this region there are, comparatively speaking, few lines, but, corresponding with the above wave-lengths, there is a triplet which has the same characteristic intensities. Herren Runge and Paschen think that their origin is probably not atmospheric, for the spectrum of the oxygen vacuum tube differs widely from the absorption spectrum of atmospheric oxygen. Mr. F. McLean has examined his photographs of the high and low sun, and has found that these lines do not depend on the altitude of the sun, which fact still further points to a solar origin. A crucial test would be to examine the opposite limbs of the sun, and find out whether any displacement of the lines occurs.

THE POLAR CAP OF MARS.—We have received the following information from America:—"A telegram received at Harvard Observatory, on January 11, from Lowell Observatory, now located near the city of Mexico, says that a rift has been observed since January 7 in the north polar cap of Mars in longitude 40°." This "rift" is probably similar to those observed at the opposition of 1894, in the southern cap. Prof. W. H. Pickering, with a 6-inch telescope, found one on May 22, crossing the cap from longitude 330° to 170°. This grew very considerably in size, measurements made on June 6 and 15 indicating a width of 100 and 350 miles respectively. Mr. Douglass also during the same month, June 10, detected a second and a third rift, the latter running from longitude 170° to 90°. The sequence of phenomena observed seems to indicate that they are due to the lower levels at the poles being uncovered; in this way, as the snow melts, the bare ground is exposed, appearing dark in contrast to the snow still lying on the more elevated heights. Their broadening is then a natural result of the departing snow, and indicates that the polar cap is at that time in a far advanced state of disintegration.